Docket 2619.260

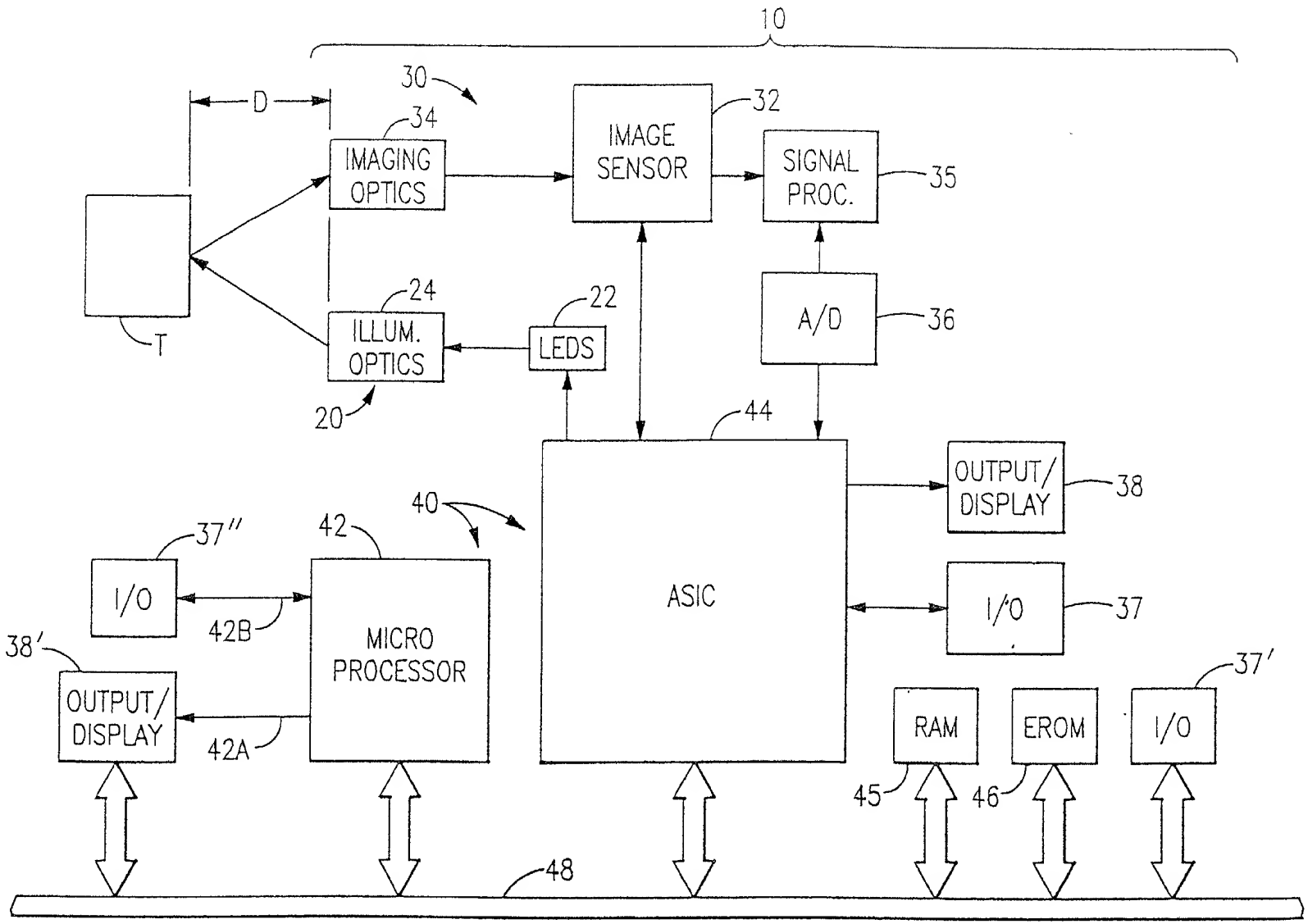


FIG.1

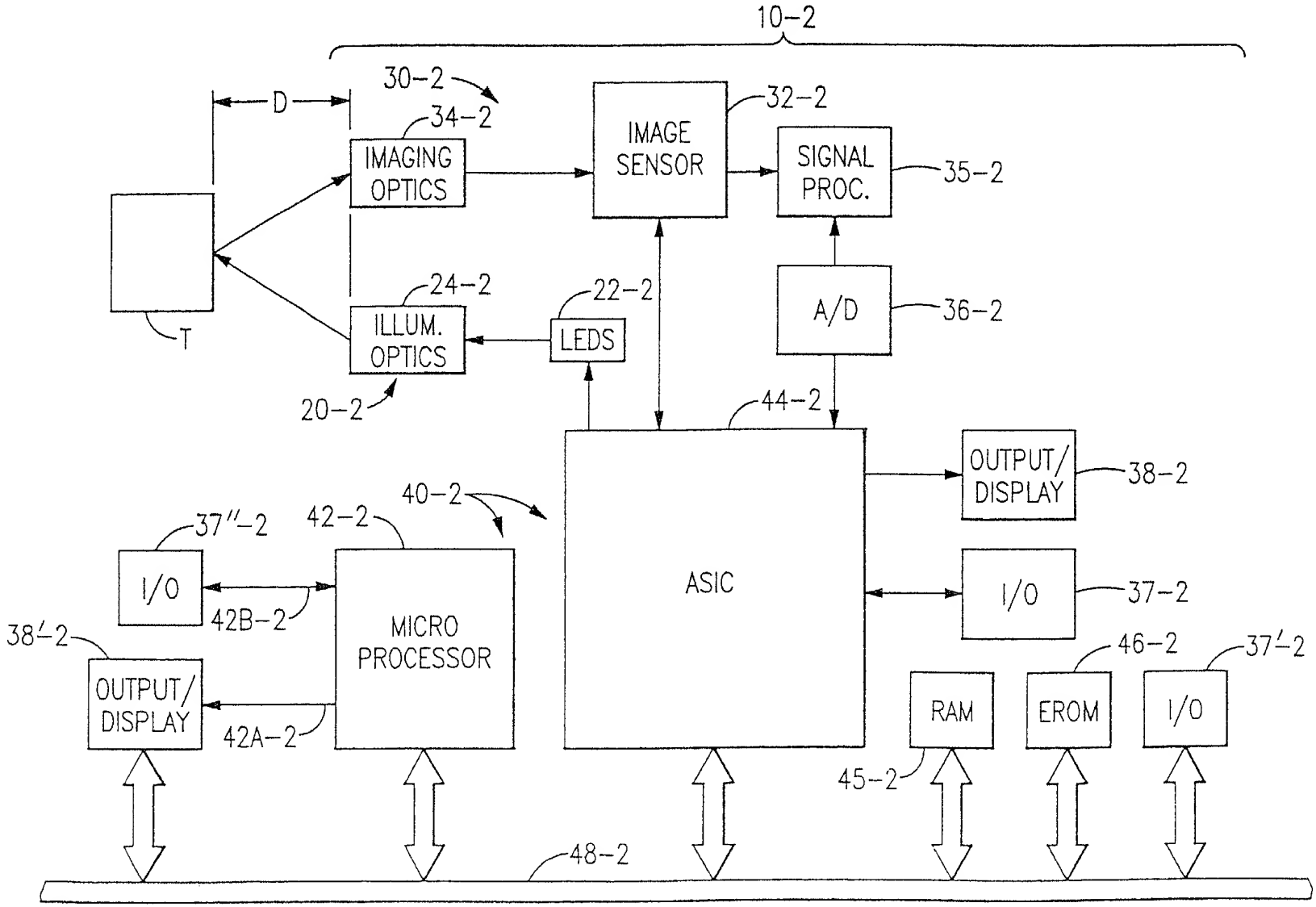


FIG.2

DOCUMENT - IPR2015-00

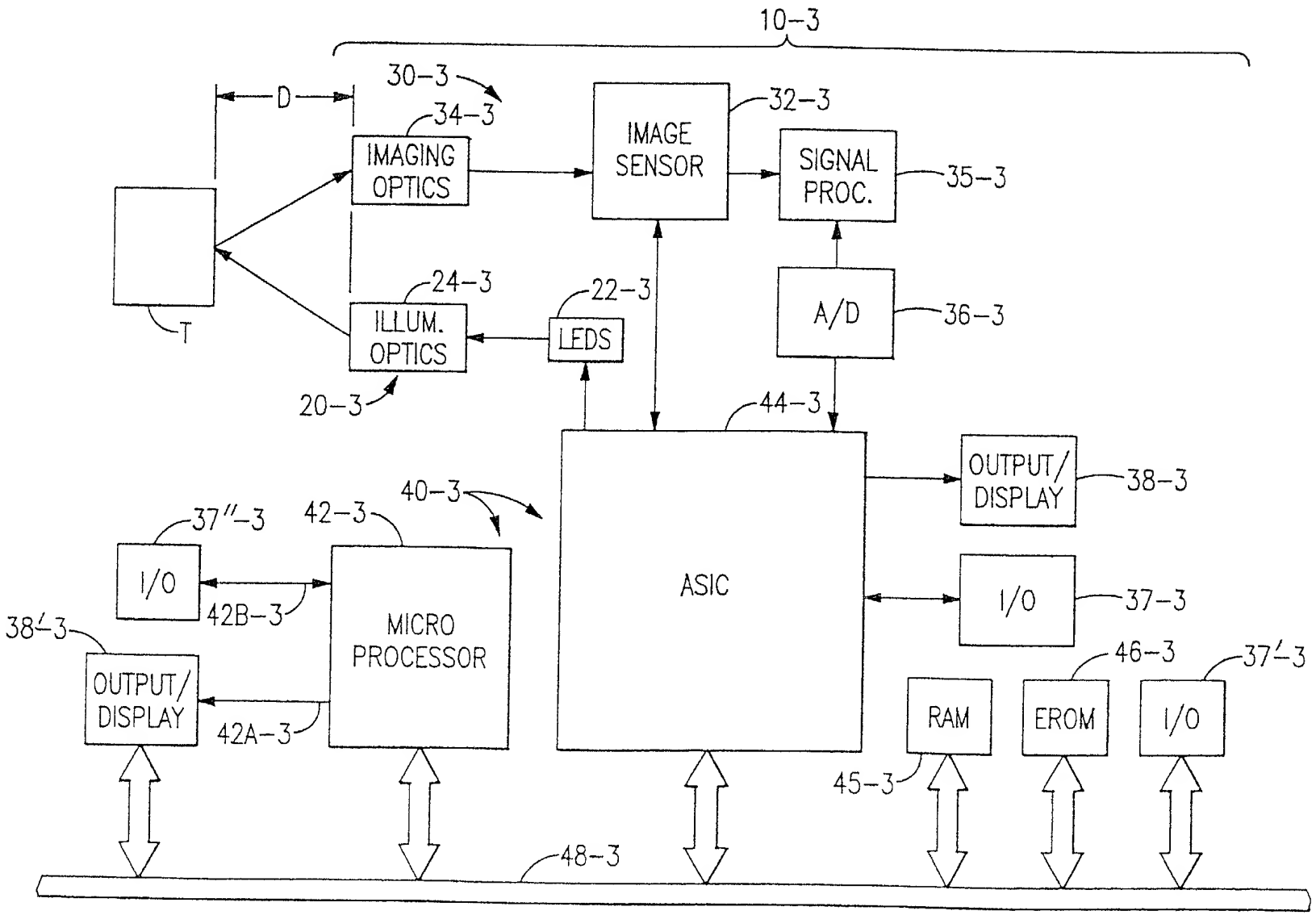

10-3
30-3
D
34-3
IMAGING OPTICS
IMAGE SENSOR
32-3
SIGNAL PROC.
35-3
T
24-3
ILLUM. OPTICS
22-3
LEDS
A/D
36-3
20-3
44-3
40-3
OUTPUT/ DISPLAY
38-3
37''-3
42-3
I/O
42B-3
MICRO PROCESSOR
ASIC
I/O
37-3
38'-3
OUTPUT/ DISPLAY
42A-3
46-3
37'-3
RAM
EROM
I/O
45-3
48-3

FIG.3

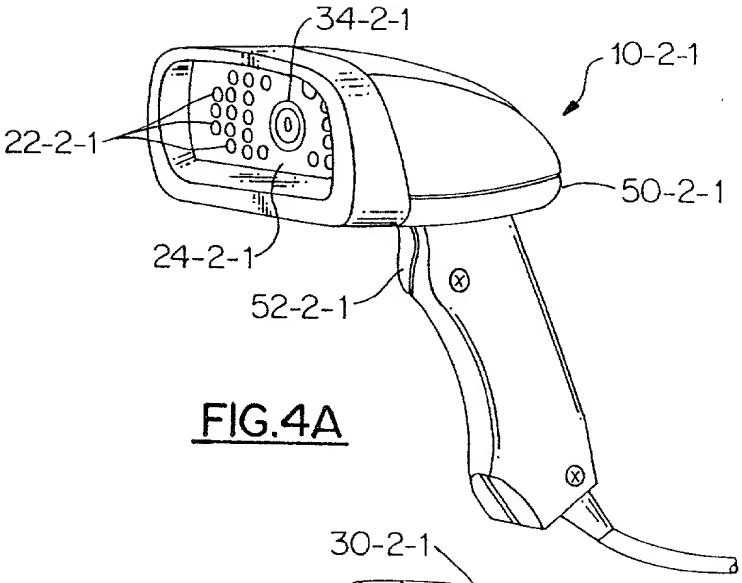


FIG.4A

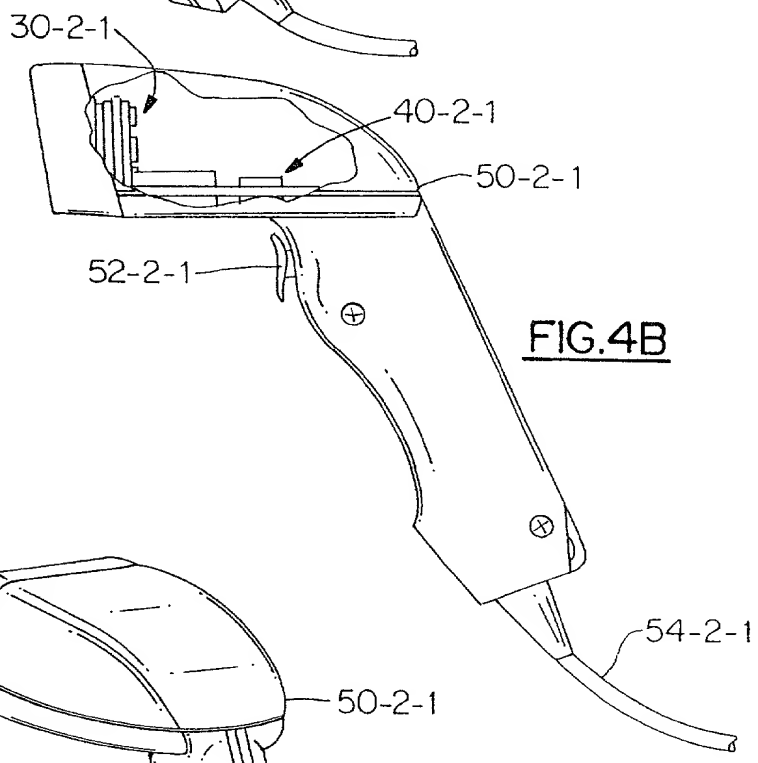


FIG.4B

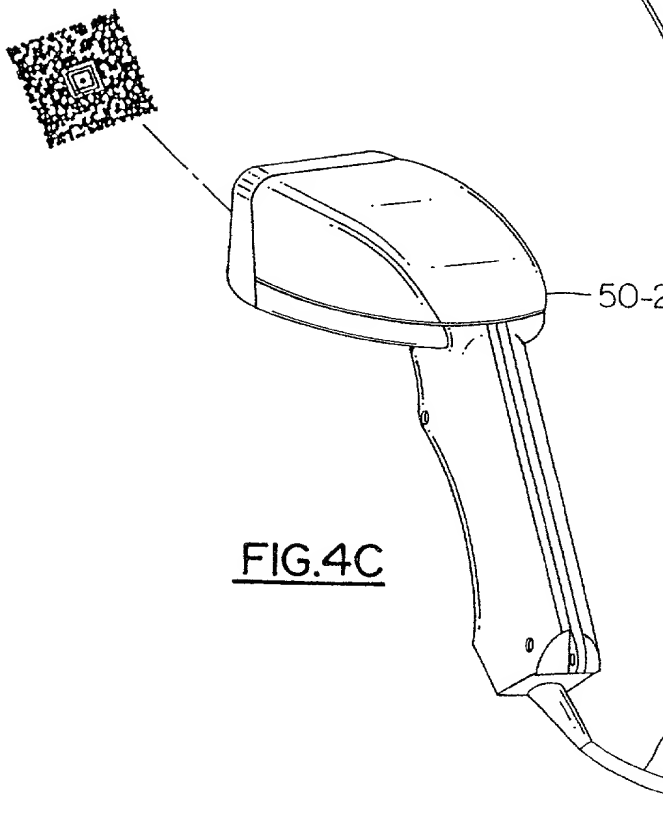


FIG.4C

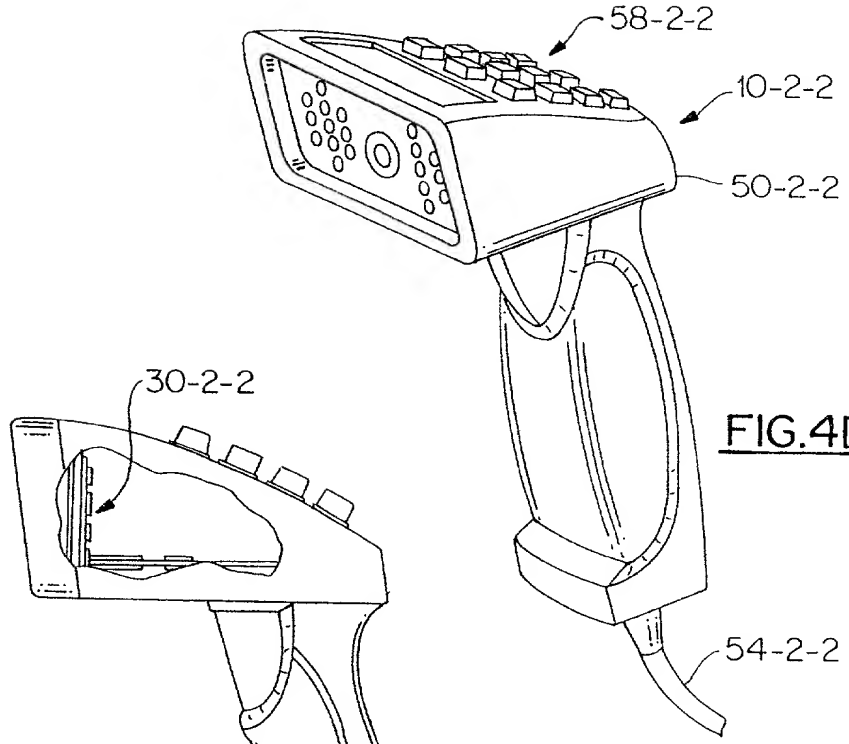


FIG.4D

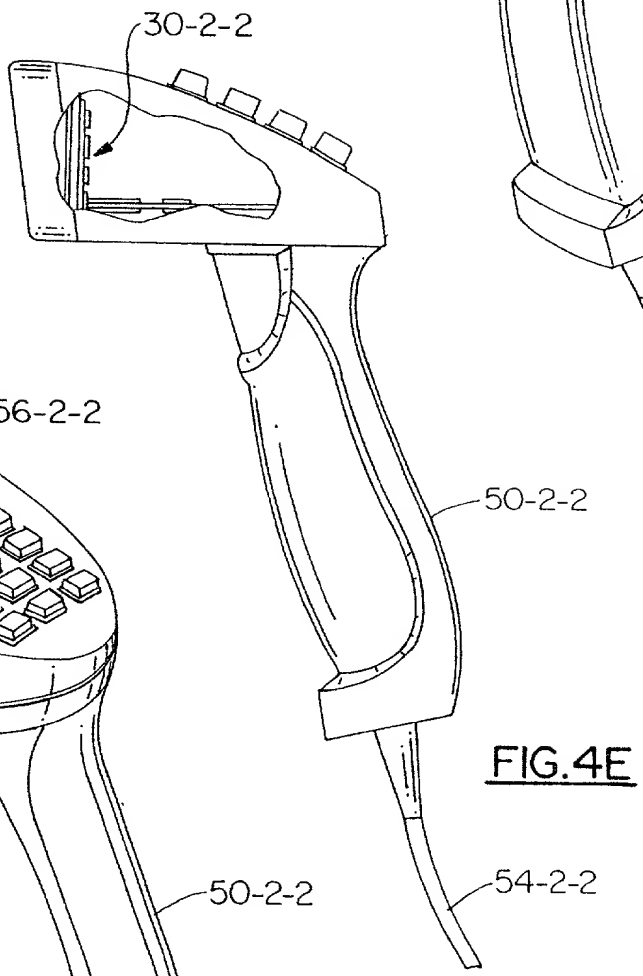


FIG.4E

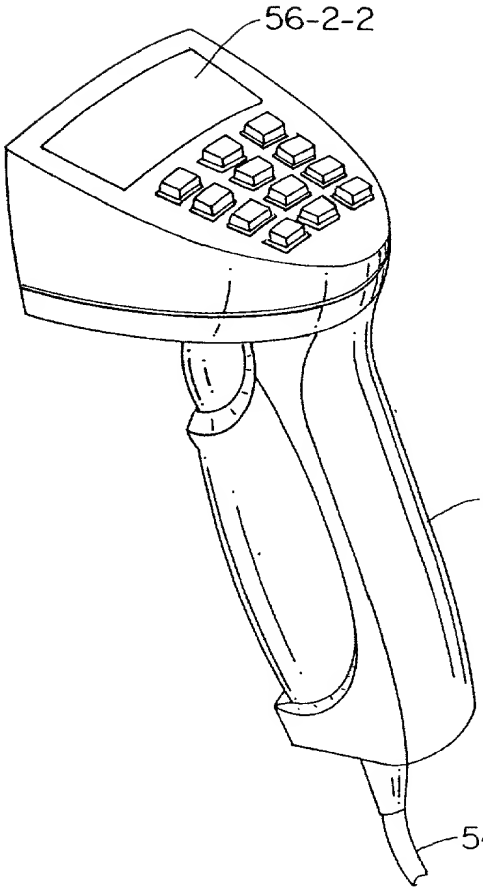


FIG.4F

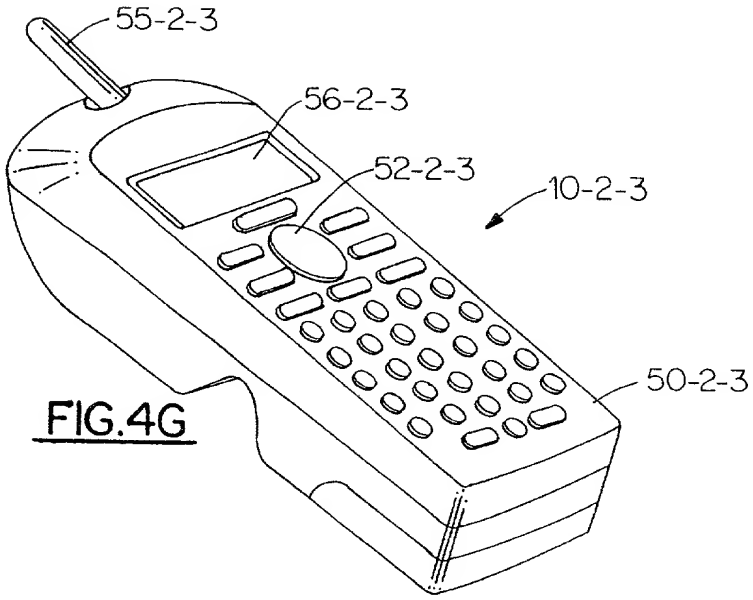


FIG.4G

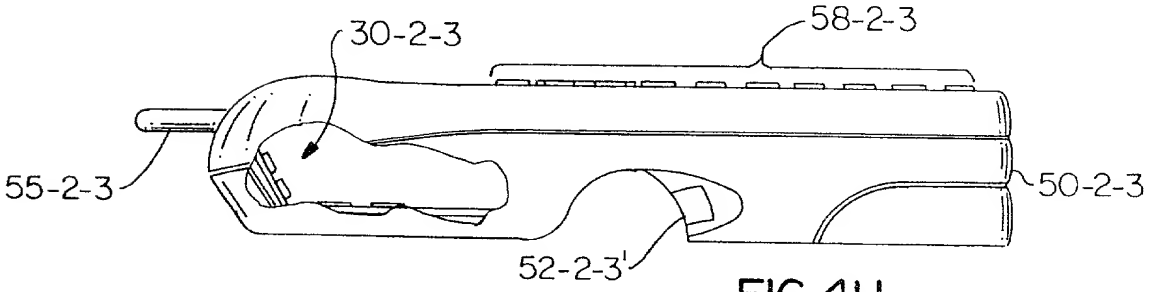


FIG.4H

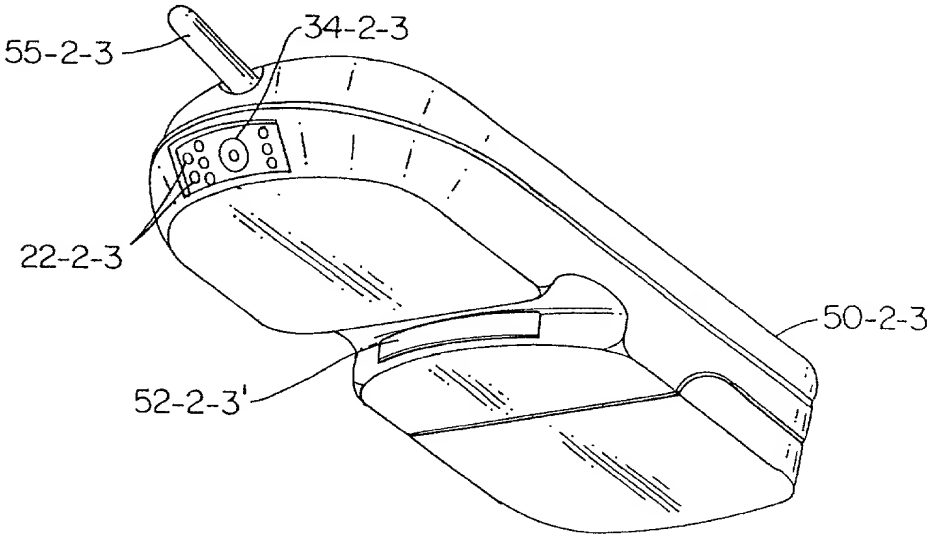


FIG.4I

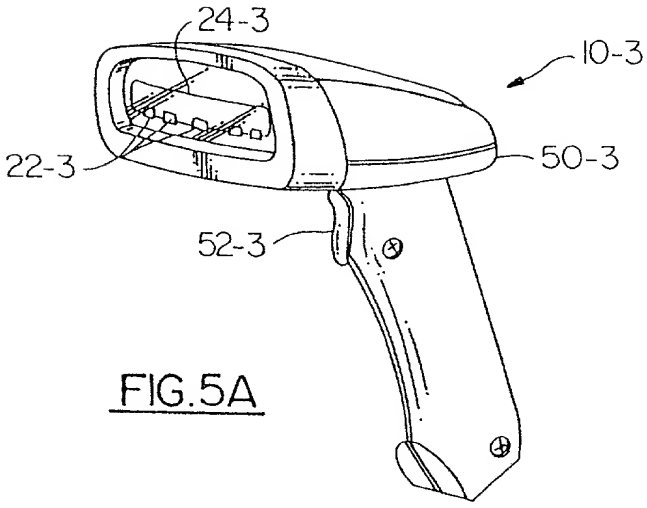


FIG.5A

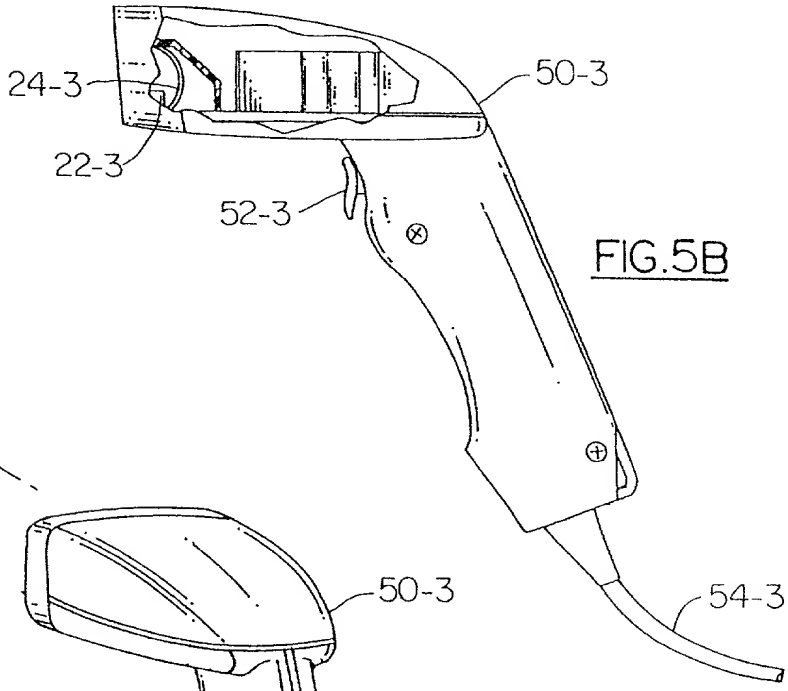


FIG.5B

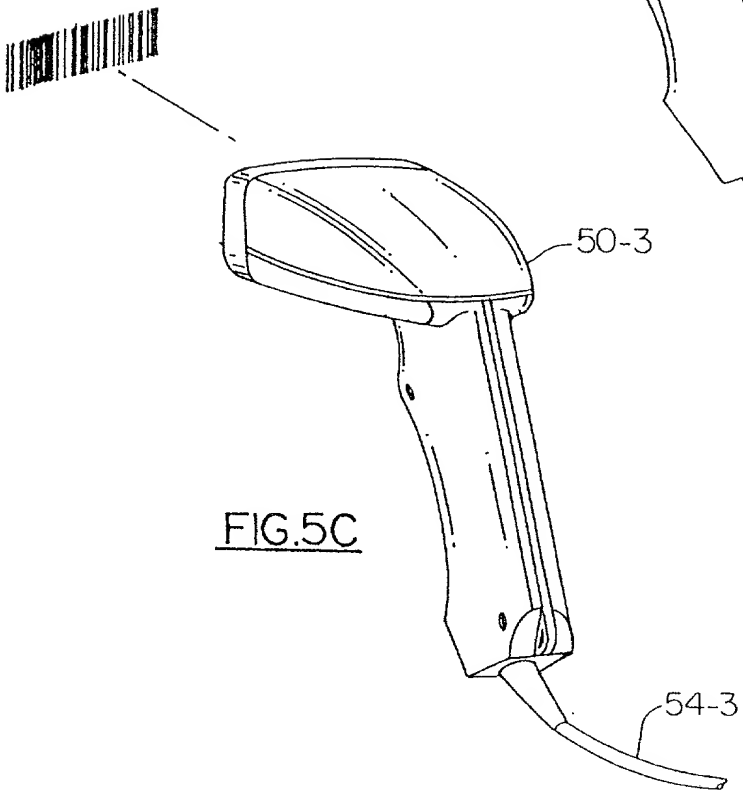


FIG.5C

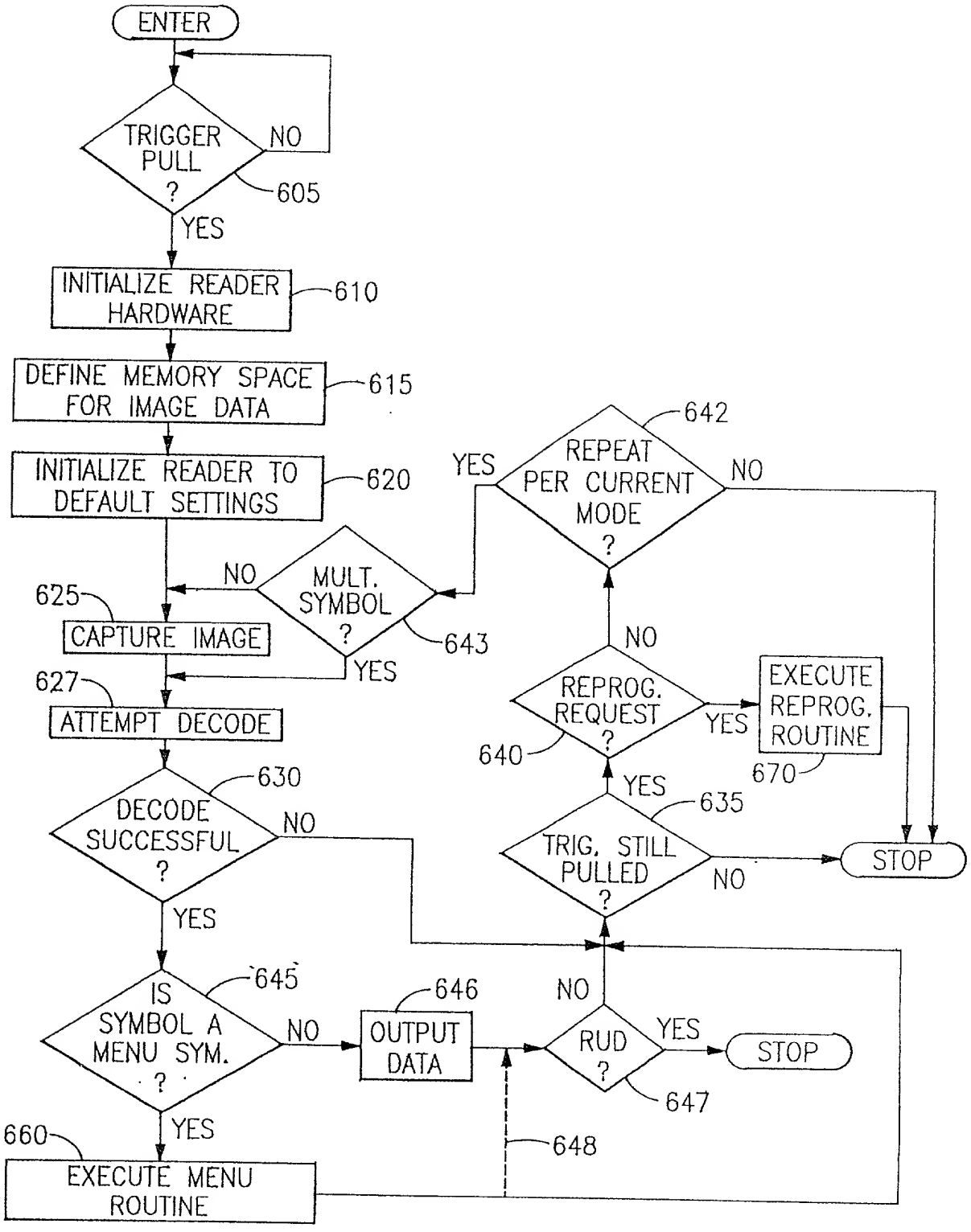

ENTER
TRIGGER PULL ?
NO
605
YES
INITIALIZE READER HARDWARE
610
DEFINE MEMORY SPACE FOR IMAGE DATA
615
INITIALIZE READER TO DEFAULT SETTINGS
620
625
CAPTURE IMAGE
627
ATTEMPT DECODE
630
DECODE SUCCESSFUL ?
NO
YES
645
IS SYMBOL A MENU SYM. ?
NO
646
OUTPUT DATA
YES
660
EXECUTE MENU ROUTINE
MULT. SYMBOL ?
NO
643
YES
642
REPEAT PER CURRENT MODE ?
YES
NO
REPROG. REQUEST ?
640
YES
EXECUTE REPROG. ROUTINE
670
NO
635
TRIG. STILL PULLED ?
NO
STOP
YES
NO
RUD ?
YES
STOP
647
648

FIG. 6A

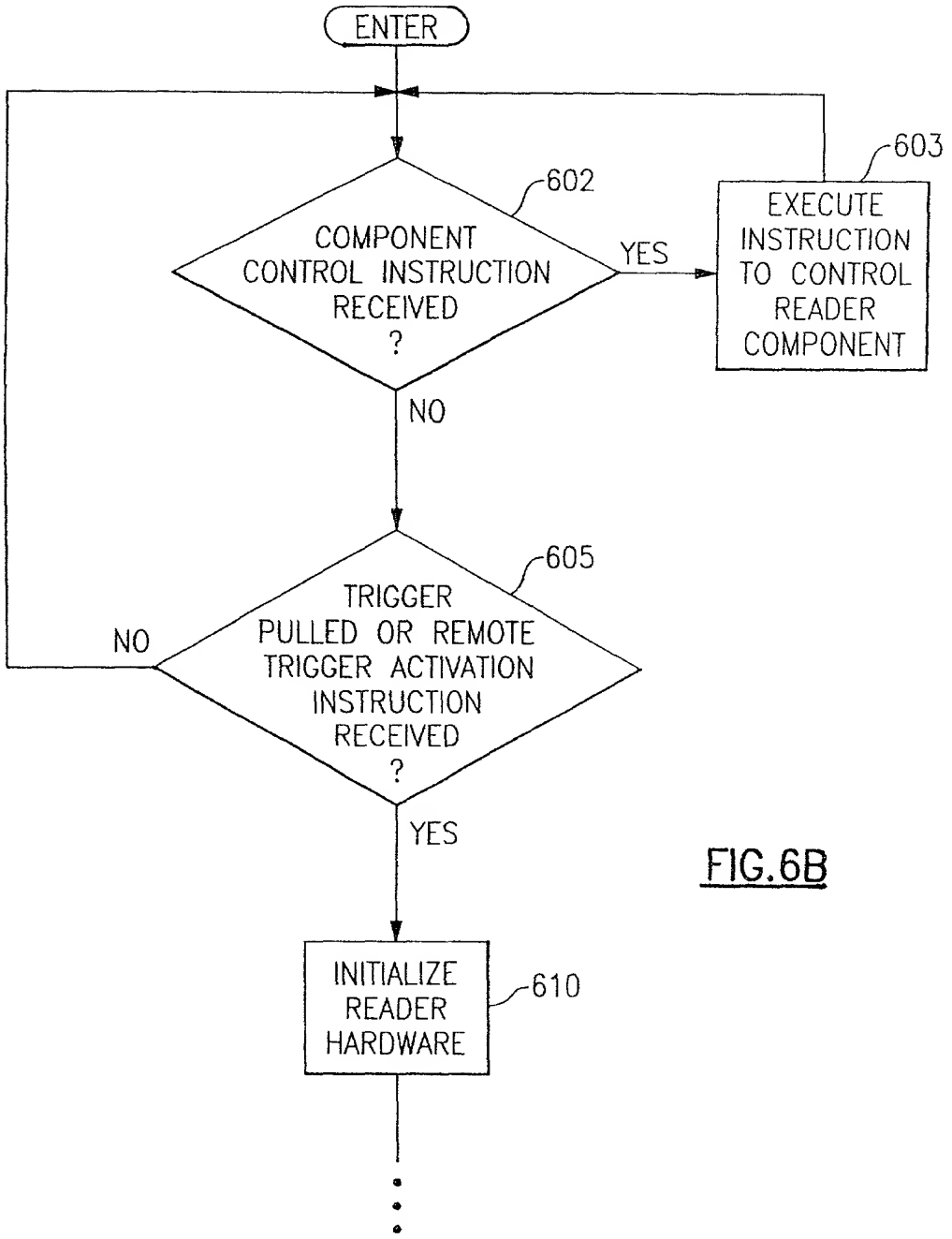

ENTER
602
COMPONENT CONTROL INSTRUCTION RECEIVED ?
YES
603
EXECUTE INSTRUCTION TO CONTROL READER COMPONENT
NO
605
TRIGGER PULLED OR REMOTE TRIGGER ACTIVATION INSTRUCTION RECEIVED ?
NO
YES
INITIALIZE READER HARDWARE
610

FIG.6B

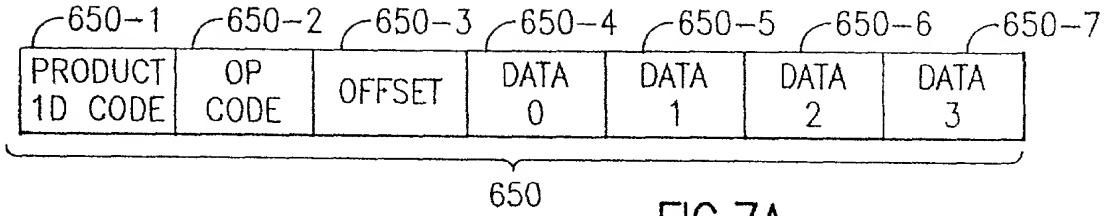


FIG.7A

OPTIONS (OFFSET) TABLE

A. COMMUNICATIONS OPTIONS
   1. RS-232
   2. BAUD RATE
   3. RF LINK
   4. ETHERNET
B. CODE OPTIONS
   1. DISABLE 1D
   2. DISABLE 2D
   3. DISABLE INDIV.
   4. MIN-MAX LENGTH
   5. MULTIPLE SYMBOLS ENABLED
C. SCANNING-DECODING OPTIONS
   1. ONE SHOT
   2. REPEAT UNTIL DONE
   3. REPEAT UNTIL STOPPED
   4. SCAN ON DEMAND
   5. SKIP SCAN
   6. DECODE ON DEMAND
D. OPERATING OPTIONS
   1. BEEPER VOLUME
   2. AIMING LED ON/OFF
   3. AURAL FEEDBACK
E. TRANSMIT OPTIONS
   1. SEND CHECK CHAR'S
   2. SEND CHECKSUM
   3. DATA EDIT OPTIONS

FIG.7B

OP CODE TABLE

A. OP CODE "0"-VECTOR PROC.
   1. OUTPUT VERSION OF SOFTWARE
   2. OUTPUT CONTENTS OF PARAMETER TABLE
   3. DISPLAY ENABLED CODES
   4. PRINT PARAMETER TABLE AS BAR CODE SYMBOL
B. OP CODE "1" - CLEAR
C. OP CODE "2" - SET
D. OP CODE "3" - TOGGLE
E. OP CODE "4" - ADD
F. OP CODE "5" - DEFAULT
G. OP CODE "6" - LOAD
H. OP CODE "7" - RESERVED

FIG.7C

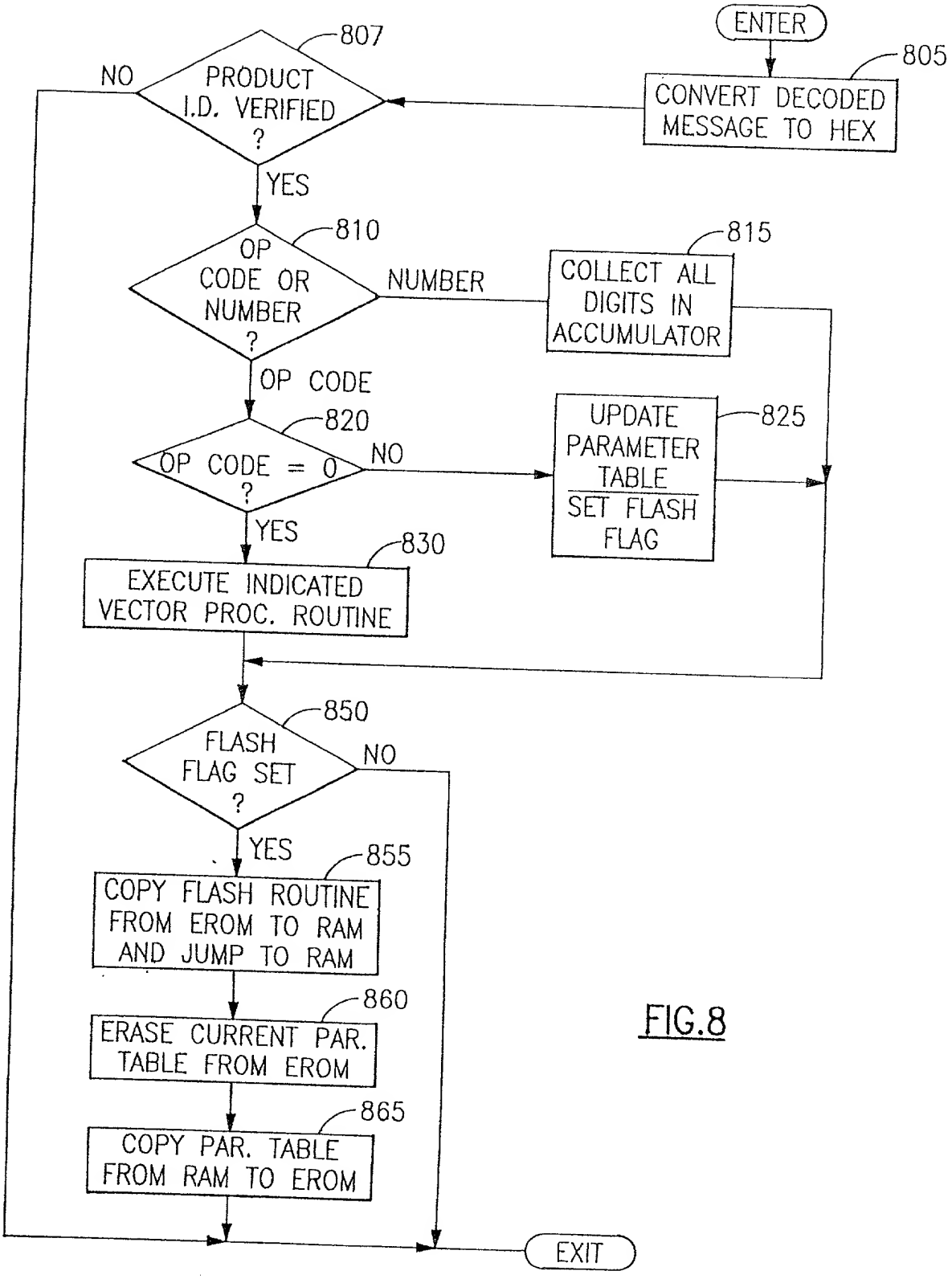
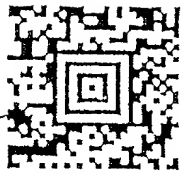

ENTER
805
CONVERT DECODED MESSAGE TO HEX
807
PRODUCT I.D. VERIFIED ?
NO
YES
810
OP CODE OR NUMBER ?
NUMBER
815
COLLECT ALL DIGITS IN ACCUMULATOR
OP CODE
820
OP CODE = 0 ?
NO
825
UPDATE PARAMETER TABLE
SET FLASH FLAG
YES
830
EXECUTE INDICATED VECTOR PROC. ROUTINE
850
FLASH FLAG SET ?
NO
YES
855
COPY FLASH ROUTINE FROM EROM TO RAM AND JUMP TO RAM
860
ERASE CURRENT PAR. TABLE FROM EROM
865
COPY PAR. TABLE FROM RAM TO EROM
EXIT

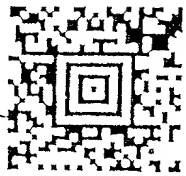
FIG.8

FIG.8A

CODE 128 SELECTION

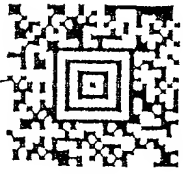

802

*ON

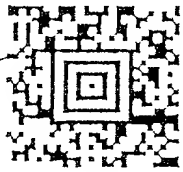

804

OFF

UPC A SELECTION


806

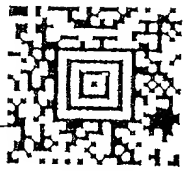
*ON


808

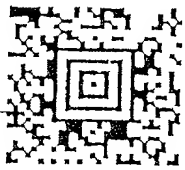
OFF

FIG.8B

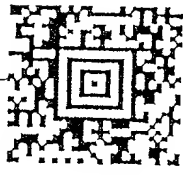
BAUD RATE SELECTION


812

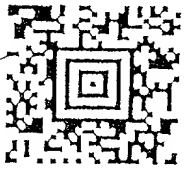
1200


814

9600


816

19200


818

*38400

FIG.8C

DEFAULT ALL CODE 11/CODE 128 SETTINGS

822

CODE 11 SELECTION

824 *ON

CODE 11

826 OFF

828 *2 CHECK DIGITS

CHECK DIGITS REQUIRED

832 1 CHECK DIGIT

834 MINIMUM ‡

MESSAGE LENGTH

836 MAXIMUM ‡

CODE 128 SELECTION

848 *ON

CODE 128

852 OFF

854 MINIMUM ‡

MESSAGE LENGTH

856 MAXIMUM ‡

‡ A TWO-DIGIT NUMBER IS REQUIRED AFTER SCANNING THIS PROGRAMMING BAR CODE. PLEASE SCAN YOUR SELECTION ON THE PROGRAMMING CHART (INSIDE BACK COVER).

RS-232D PORT 2 (D OUTPUT)

DEFAULT ALL RS-232 PORT 2 SETTINGS

858

CTS CHECK SELECTION

862 ENABLE

864 *DISABLE

BAUD RATE SELECTION

866 300

868 600

872 1200

874 2400

876 4800

878 *9600

882 19200

884 38400

FIG.8D

Offset Attached

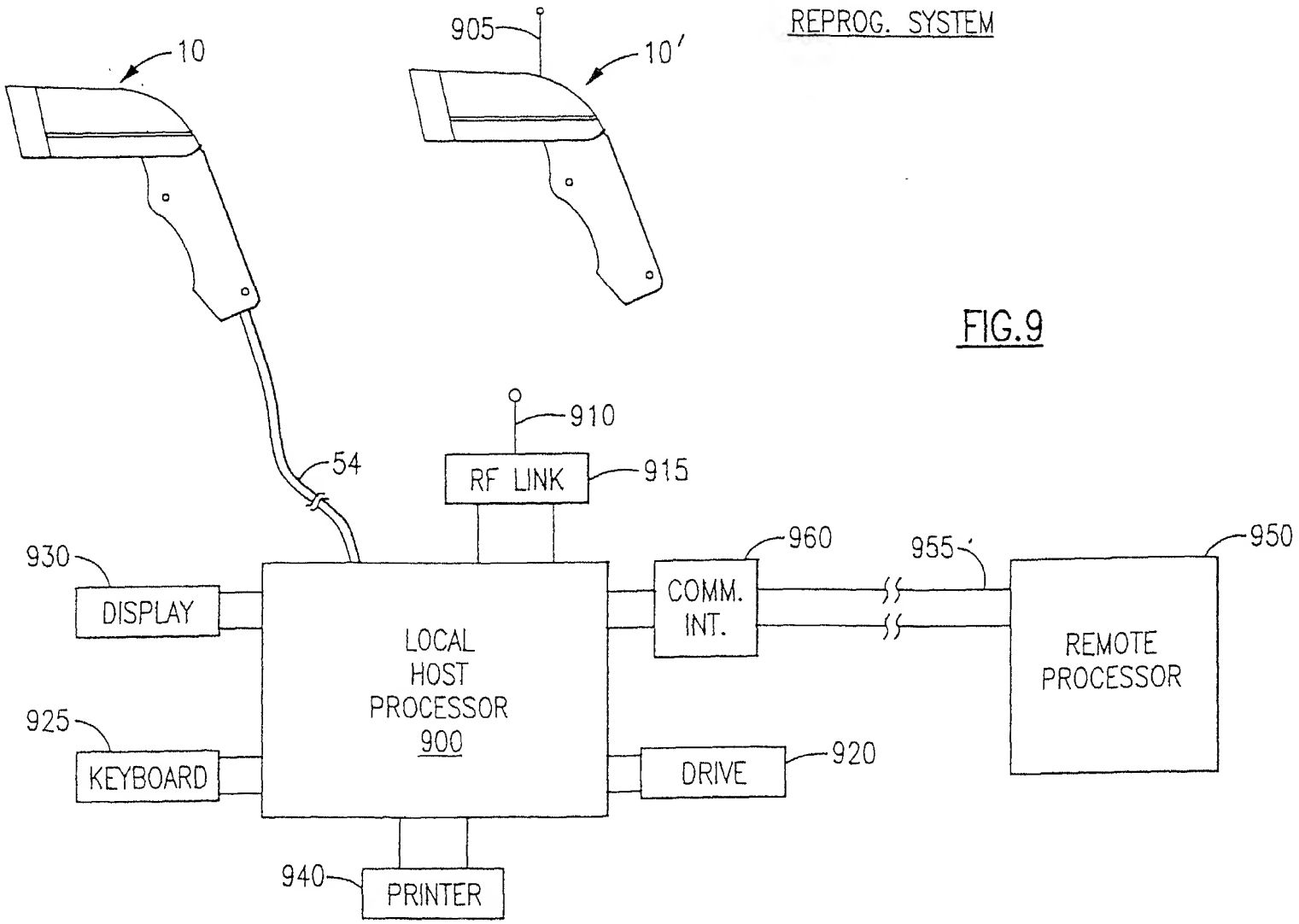


FIG.9

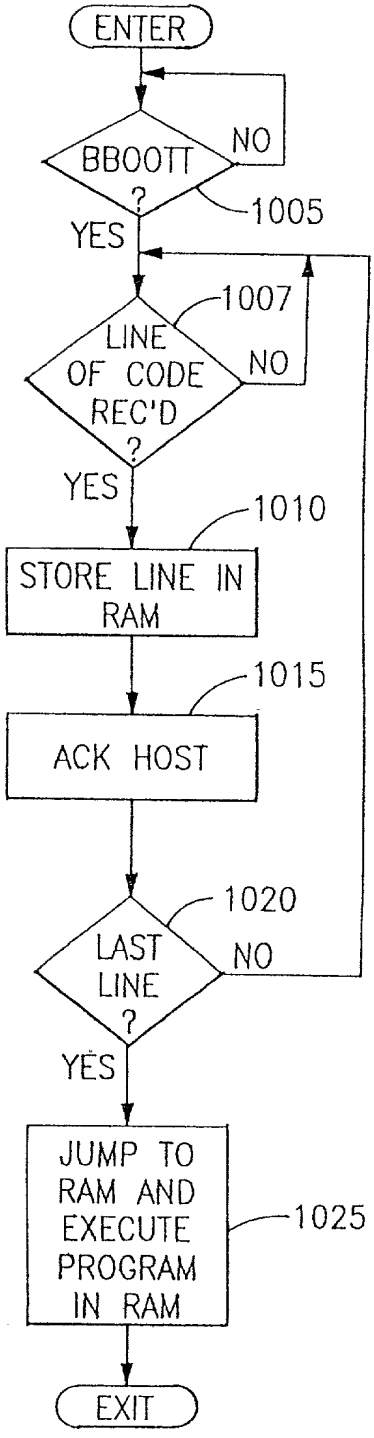


FIG. 10A

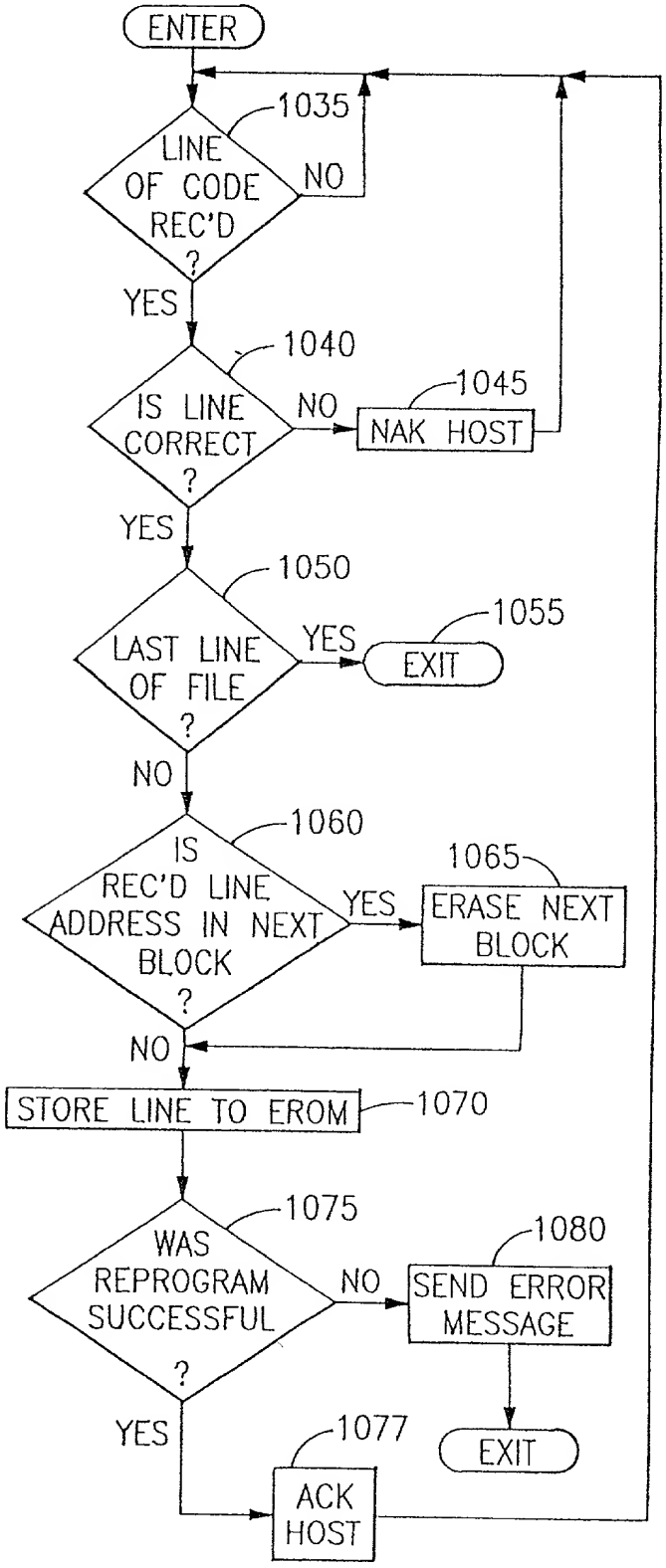


FIG. 10B

0012267 2679260

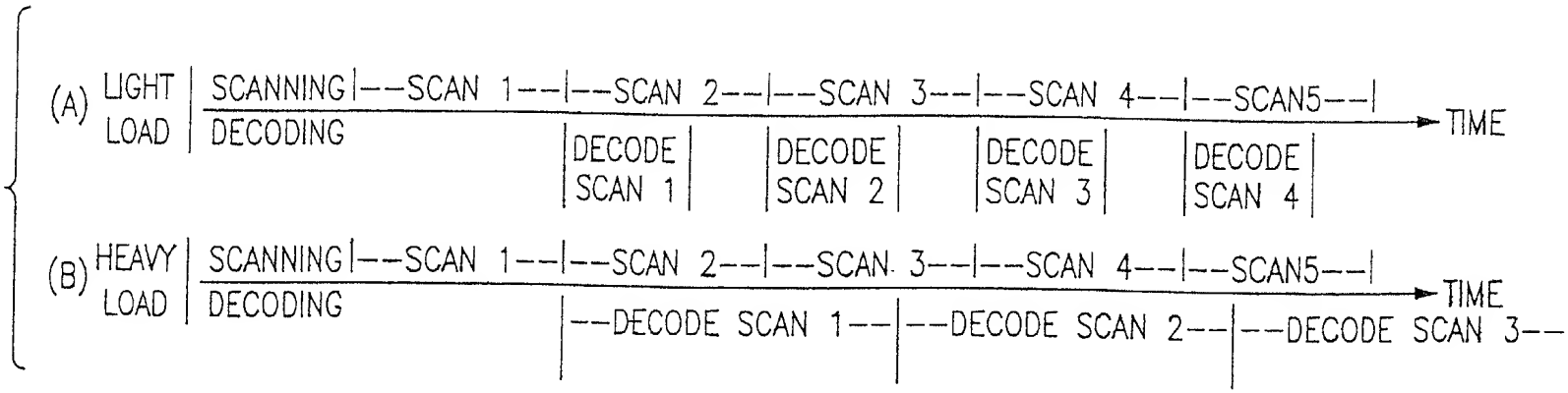


FIG.12
Prior Art

FIG.13

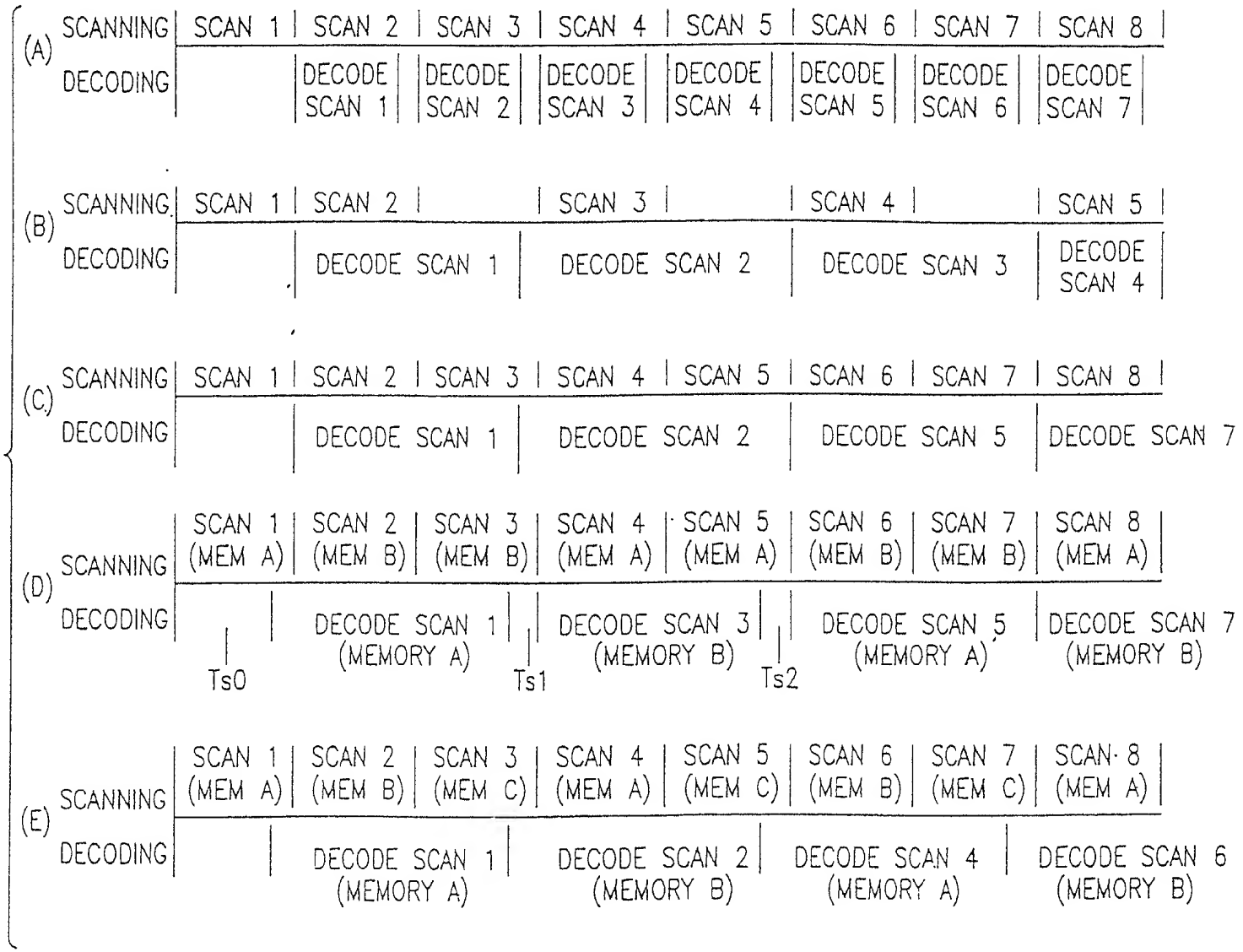
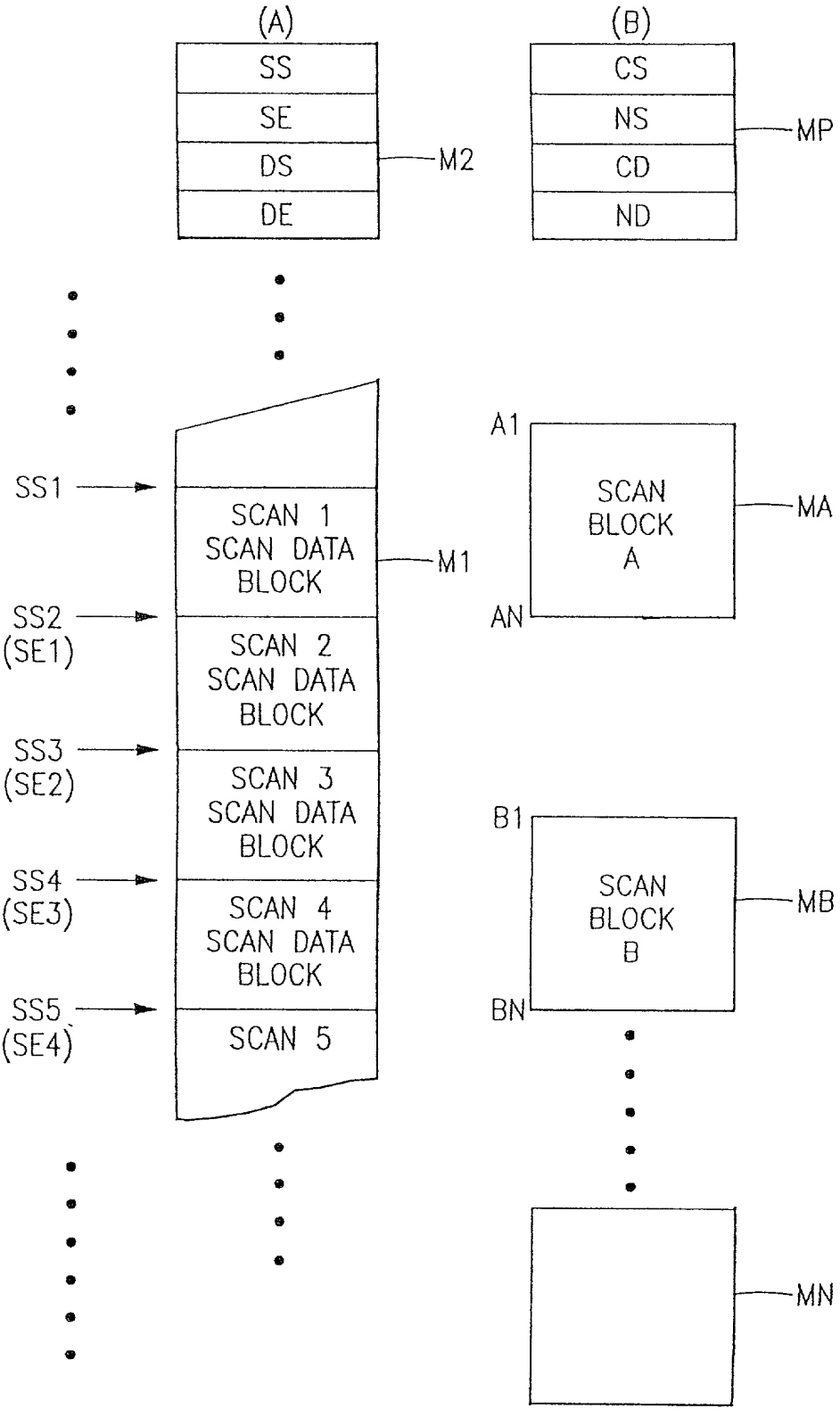

(A)
SCANNING
SCAN 1
SCAN 2
SCAN 3
SCAN 4
SCAN 5
SCAN 6
SCAN 7
SCAN 8
DECODING
DECODE SCAN 1
DECODE SCAN 2
DECODE SCAN 3
DECODE SCAN 4
DECODE SCAN 5
DECODE SCAN 6
DECODE SCAN 7
(B)
SCANNING
SCAN 1
SCAN 2
SCAN 3
SCAN 4
SCAN 5
DECODING
DECODE SCAN 1
DECODE SCAN 2
DECODE SCAN 3
DECODE SCAN 4
(C)
SCANNING
SCAN 1
SCAN 2
SCAN 3
SCAN 4
SCAN 5
SCAN 6
SCAN 7
SCAN 8
DECODING
DECODE SCAN 1
DECODE SCAN 2
DECODE SCAN 5
DECODE SCAN 7
(D)
SCANNING
SCAN 1 (MEM A)
SCAN 2 (MEM B)
SCAN 3 (MEM B)
SCAN 4 (MEM A)
SCAN 5 (MEM A)
SCAN 6 (MEM B)
SCAN 7 (MEM B)
SCAN 8 (MEM A)
DECODING
DECODE SCAN 1 (MEMORY A)
DECODE SCAN 3 (MEMORY B)
DECODE SCAN 5 (MEMORY A)
DECODE SCAN 7 (MEMORY B)
Ts0
Ts1
Ts2
(E)
SCANNING
SCAN 1 (MEM A)
SCAN 2 (MEM B)
SCAN 3 (MEM C)
SCAN 4 (MEM A)
SCAN 5 (MEM C)
SCAN 6 (MEM B)
SCAN 7 (MEM C)
SCAN 8 (MEM A)
DECODING
DECODE SCAN 1 (MEMORY A)
DECODE SCAN 2 (MEMORY B)
DECODE SCAN 4 (MEMORY A)
DECODE SCAN 6 (MEMORY B)

FIG.14


(A)
SS
SE
DS
DE
M2
(B)
CS
NS
CD
ND
MP
SS1
SCAN 1
SCAN DATA
BLOCK
M1
SS2
(SE1)
SCAN 2
SCAN DATA
BLOCK
SS3
(SE2)
SCAN 3
SCAN DATA
BLOCK
SS4
(SE3)
SCAN 4
SCAN DATA
BLOCK
SS5
(SE4)
SCAN 5
A1
SCAN
BLOCK
A
AN
MA
B1
SCAN
BLOCK
B
BN
MB
MN

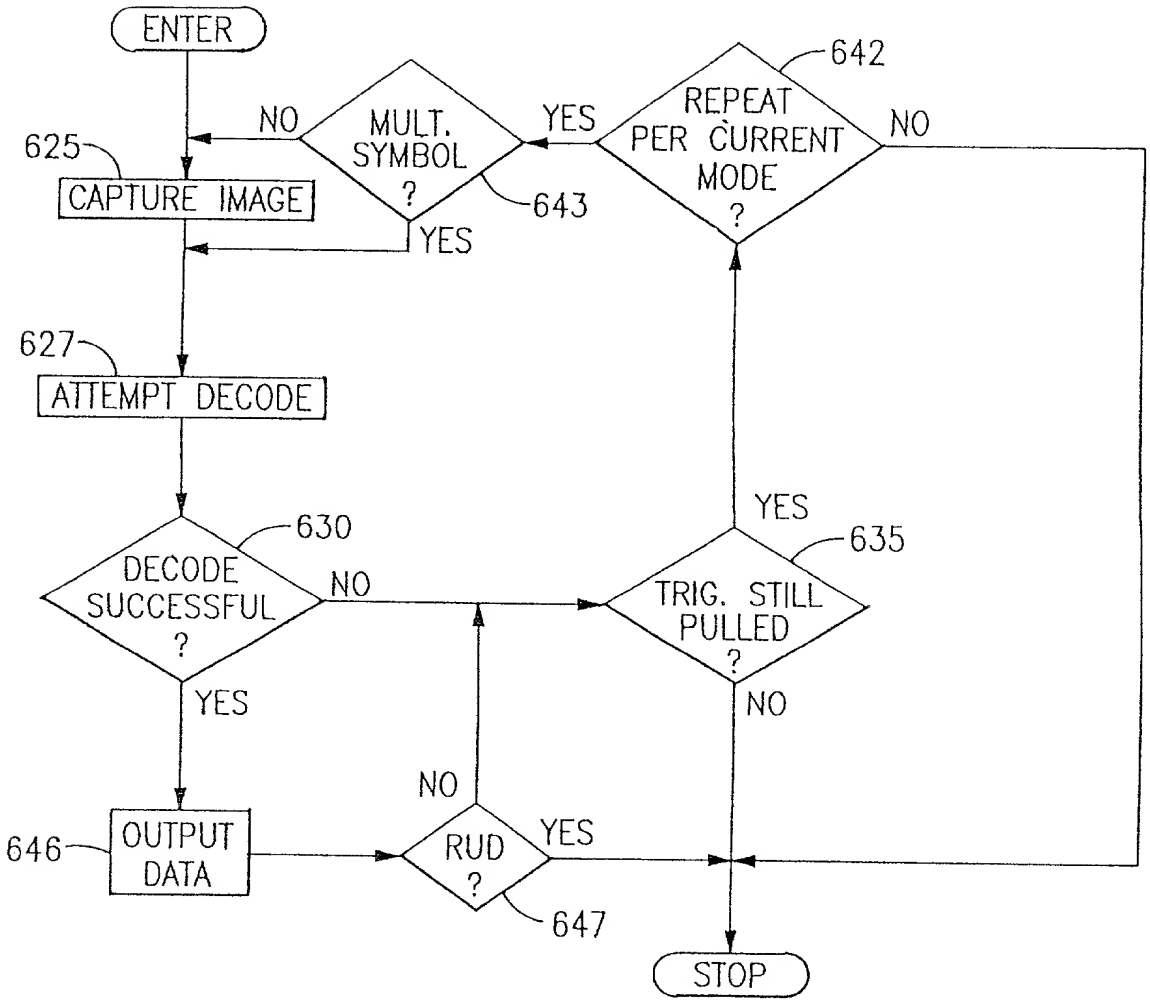

ENTER
642
REPEAT PER CURRENT MODE ?
NO
YES
MULT. SYMBOL ?
NO
625
CAPTURE IMAGE
643
YES
627
ATTEMPT DECODE
YES
630
635
DECODE SUCCESSFUL ?
NO
TRIG. STILL PULLED ?
YES
NO
NO
646
OUTPUT DATA
RUD ?
YES
647
STOP

FIG.15

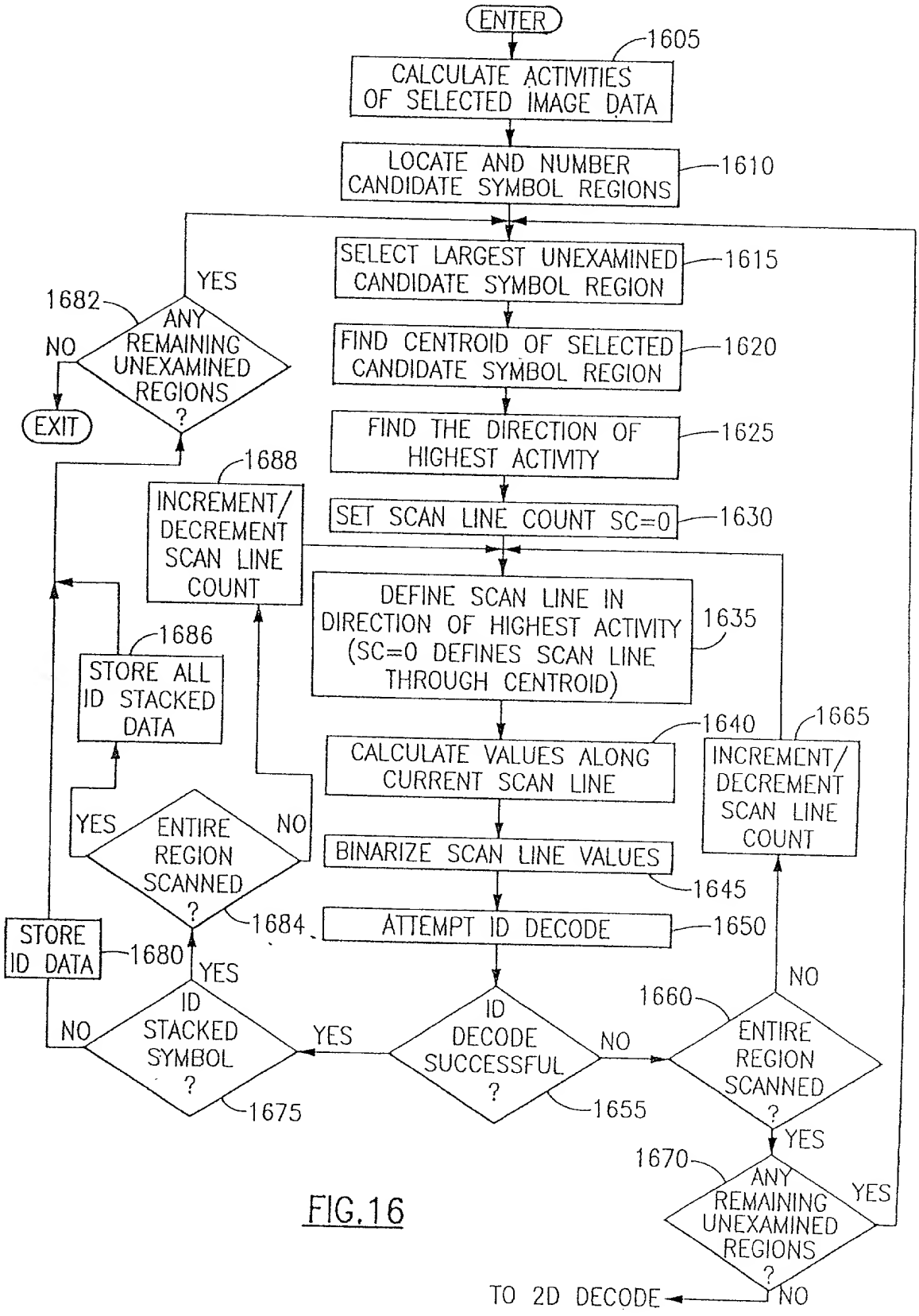

ENTER
1605
CALCULATE ACTIVITIES OF SELECTED IMAGE DATA
LOCATE AND NUMBER CANDIDATE SYMBOL REGIONS
1610
SELECT LARGEST UNEXAMINED CANDIDATE SYMBOL REGION
1615
FIND CENTROID OF SELECTED CANDIDATE SYMBOL REGION
1620
FIND THE DIRECTION OF HIGHEST ACTIVITY
1625
SET SCAN LINE COUNT SC=0
1630
DEFINE SCAN LINE IN DIRECTION OF HIGHEST ACTIVITY (SC=0 DEFINES SCAN LINE THROUGH CENTROID)
1635
CALCULATE VALUES ALONG CURRENT SCAN LINE
1640
BINARIZE SCAN LINE VALUES
1645
ATTEMPT ID DECODE
1650
ID DECODE SUCCESSFUL ?
1655
YES
NO
ENTIRE REGION SCANNED ?
1660
YES
NO
INCREMENT/ DECREMENT SCAN LINE COUNT
1665
ANY REMAINING UNEXAMINED REGIONS ?
1670
YES
NO
TO 2D DECODE
ID STACKED SYMBOL ?
1675
YES
NO
STORE ID DATA
1680
ENTIRE REGION SCANNED ?
1684
YES
NO
STORE ALL ID STACKED DATA
1686
INCREMENT/ DECREMENT SCAN LINE COUNT
1688
ANY REMAINING UNEXAMINED REGIONS ?
1682
YES
NO
EXIT

FIG.16

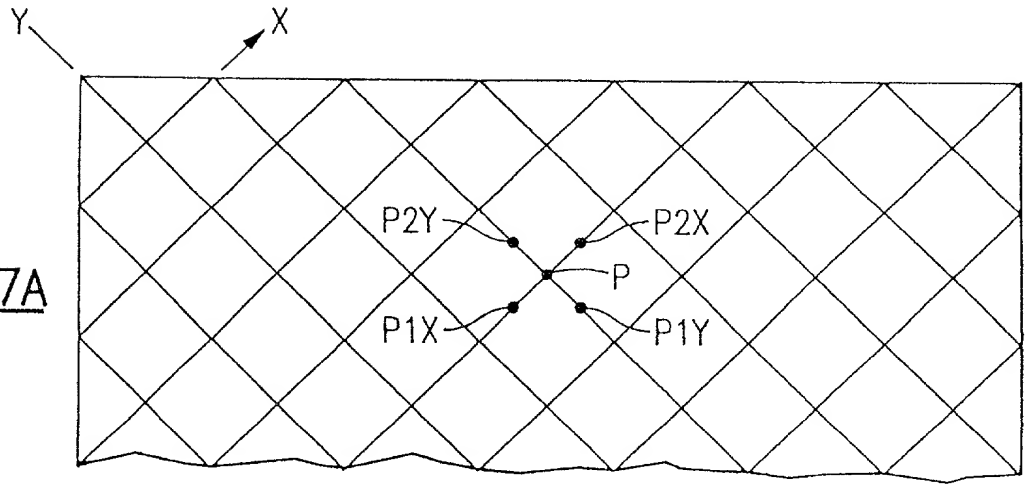


FIG.17A

$$A_P = (P2X-P1X)^2 + (P2Y-P1Y)^2$$

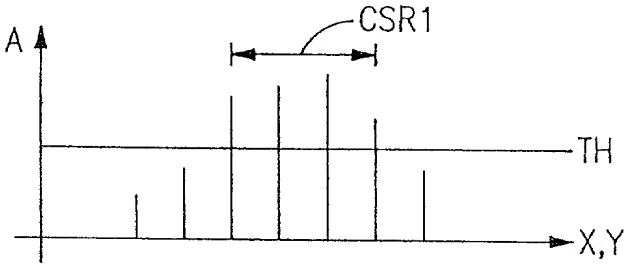


FIG.17B

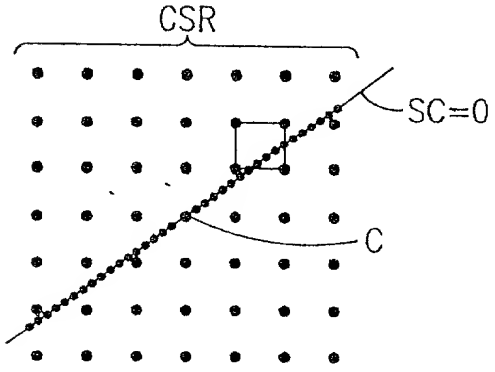


FIG.17C

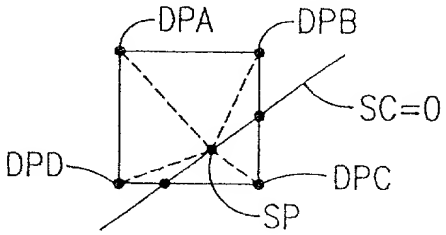


FIG.17D

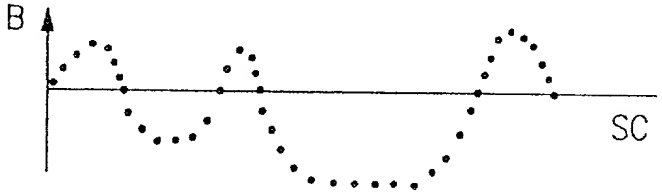


FIG.17E

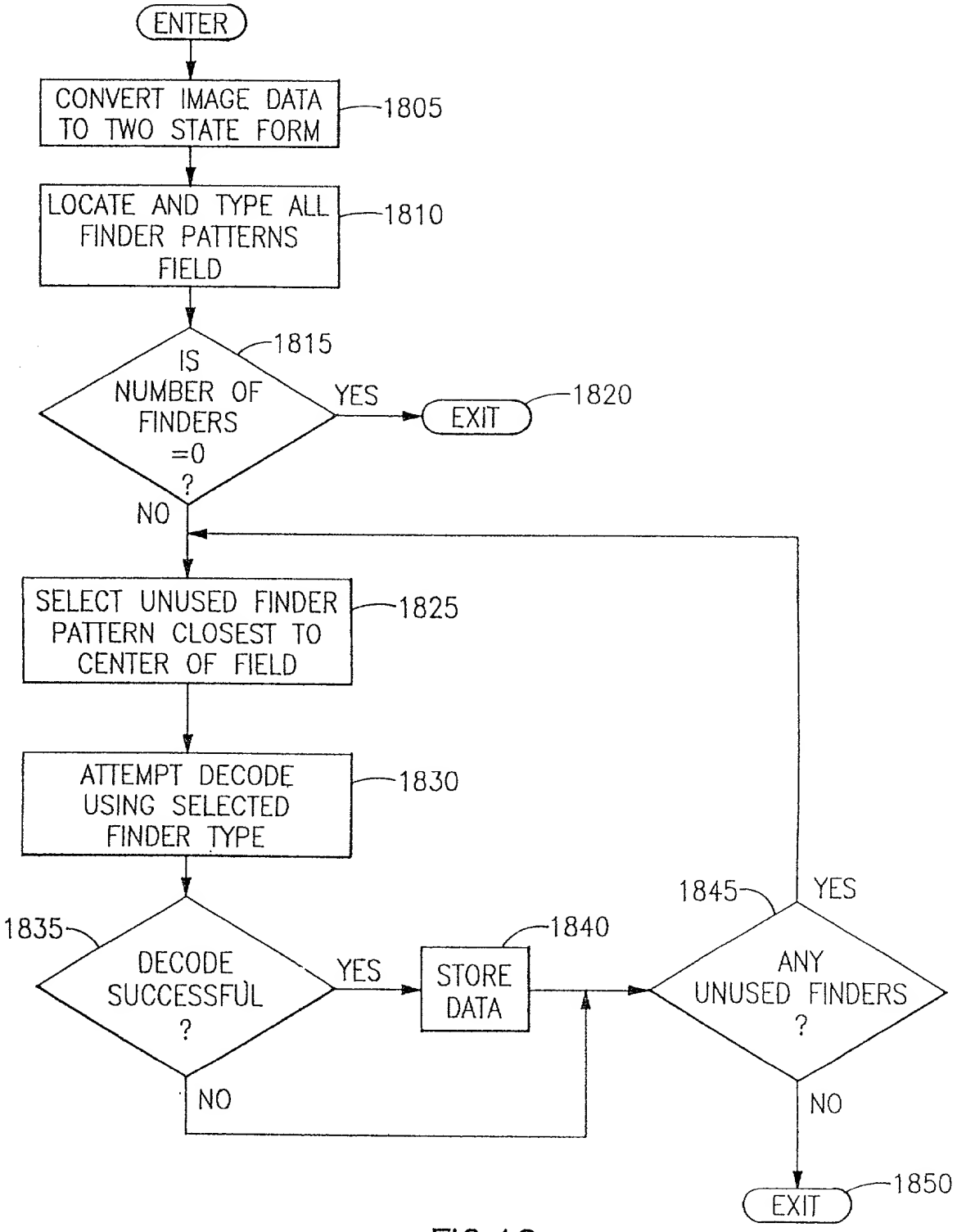

ENTER
CONVERT IMAGE DATA TO TWO STATE FORM
1805
LOCATE AND TYPE ALL FINDER PATTERNS FIELD
1810
IS NUMBER OF FINDERS =0 ?
1815
YES
EXIT
1820
NO
SELECT UNUSED FINDER PATTERN CLOSEST TO CENTER OF FIELD
1825
ATTEMPT DECODE USING SELECTED FINDER TYPE
1830
1835
DECODE SUCCESSFUL ?
YES
STORE DATA
1840
NO
1845
YES
ANY UNUSED FINDERS ?
NO
EXIT
1850

FIG.18

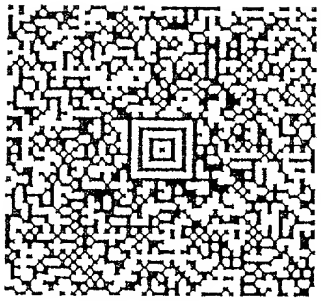


FIG.19A

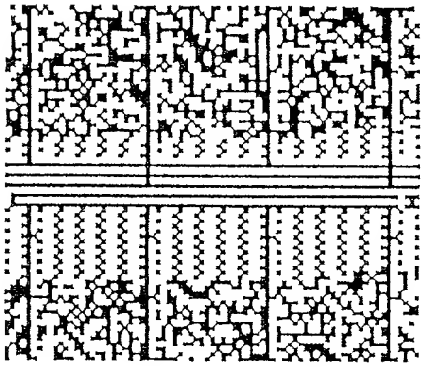


FIG.19B

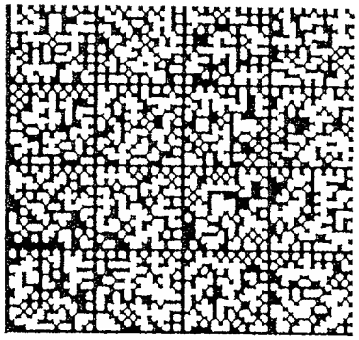


FIG.19C

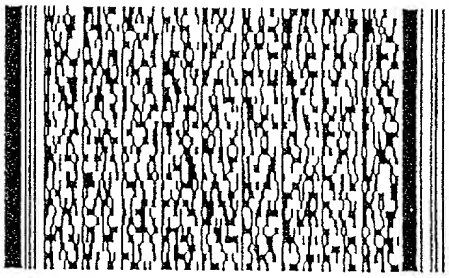


FIG.19D

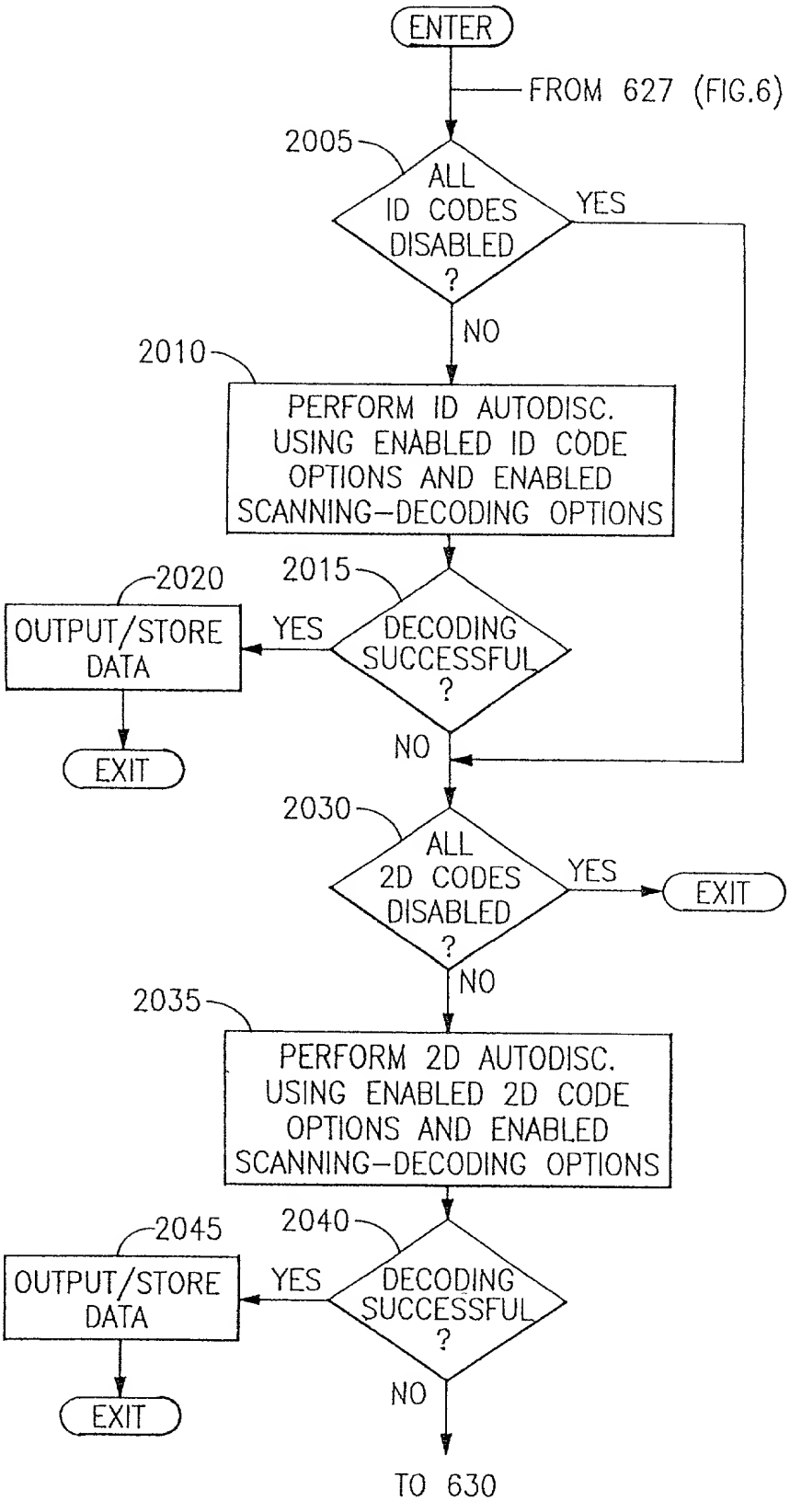

ENTER
FROM 627 (FIG.6)
2005
ALL ID CODES DISABLED ?
YES
NO
2010
PERFORM ID AUTODISC. USING ENABLED ID CODE OPTIONS AND ENABLED SCANNING–DECODING OPTIONS
2015
DECODING SUCCESSFUL ?
YES
2020
OUTPUT/STORE DATA
EXIT
NO
2030
ALL 2D CODES DISABLED ?
YES
EXIT
NO
2035
PERFORM 2D AUTODISC. USING ENABLED 2D CODE OPTIONS AND ENABLED SCANNING–DECODING OPTIONS
2040
DECODING SUCCESSFUL ?
YES
2045
OUTPUT/STORE DATA
EXIT
NO
TO 630

FIG.20